REMARKS

Claims 1-4 are pending in the present application. Claims 3-4 are currently withdrawn from consideration. Claim 1 has been amended. No new matter has been added by way of the above amendment. The recitation in claim 1 is supported by the present specification, *inter alia*, at page 10, line 25. Accordingly, no new matter has been added.

In view of the following remarks, the Examiner is respectfully requested to withdraw all rejections and allow the currently pending claims.

Election/Restriction

The Examiner notes that a provisional election was made with traverse to prosecute the invention of Group I, claims 1-2. Applicants affirm this election.

Issues under 35 U.S.C. § 103

The Examiner has rejected claims 1 and 2 under 35 U.S.C. § 103(a) as being unpatentable over Yushio et al. '400 (US Patent 6,423,400) in view of Yamakawa et al. '907 (US Patent 5,370,907) and Ito et al. '223 (PCT/JP02/08223) (English translation is US 2004/0071945). Applicants respectfully traverse this rejection.

The Present Invention and its Advantages

The AlN junction body of the present invention has a basic structure in which a sintered metal layer of tungsten or molybdenum having a thickness of 15 to 100 μm is sandwiched and joined between two pieces of AlN sintered plates. As described in claim 1, the sintered metal layer has the following properties:

(a) the sheet resistivity of the sintered metal layer is not larger than 1×10^{-1} Ω/□, exhibiting excellent electric conductivity;

(b) warping of the sintered metal layer is not more than 100 μm/100mm, forming a flat shape; and

(c) sintered metal layer is joined to the AlN sintered plates so as to possess a shear strength of 4 kg/mm^2.

Upon applying a high DC voltage to the sintered metal layer, the AlN junction body provided with the sintered metal layer having the above properties generates a uniform electrostatic adsorbing force on the surfaces of the AlN sintered plates. This makes it possible to stably hold a semiconductor wafer even under severe conditions and can be preferably used as an electrostatic chuck.

The above AlN junction body can be produced by charging an electrically conducting paste containing a fine tungsten or molybdenum powder (having an average particle size of not larger than 3.5 μm) in a recessed portion formed in the surface of the AlN sintered plate. An adhesive layer is formed by applying an adhesive paste containing AlN onto the surface of the AlN sintered plate followed by dewaxing. Another AlN sintered plate is then brought into pressed contact with the surface on which the adhesive layer has been formed. Sintering is then effected in this state in two steps at a temperature of 1600 to 1700°C (primary sintering) and at a temperature of 1800 to 1900°C (secondary sintering). When the above method is employed, the AlN junction body having the above-mentioned properties is obtained. Other methods, such as those of the prior art, do not result in the present AlN junction body.

<u>Distinctions over the Cited Prior Art</u>

Yushio et al. '400 teach a susceptor for semiconductor manufacturing equipment obtained by laminating plural aluminum nitride ceramic substrates with a high melting point metallic layer and an adhesive layer. The high melting point metallic layer can contain W or Mo. The Examiner admits that the cited prior art is silent as to the sheet resistivity of the metal layer. However, the Examiner asserts that the sheet resistivity would be the same since Yushio et al. '400 allegedly teach the same materials and the same overlapping layer thickness ranges.

However, according to the AlN junction body of Yushio et al. '400, the sintered metal layer is joined to the surface of the AlN sintered plate via an adhesive layer of a low-melting glass. The high-melting metal layer is preferably blended with a low-melting glass to increase the junction strength between the high-melting metal layer and the AlN sintered plate. That is, the sintered metal layer is formed of W or Mo but is joined via the adhesive layer of a low-melting glass. Therefore, the low-melting glass infiltrates into the sintered metal layer causing an increase in the electric resistance, as a matter of course, and making it difficult to obtain a sheet resistance as specified by the present invention. In addition, when the high-melting metal layer is blended with the low-melting glass, the electric resistance of the high-melting metal layer further increases, making it quite difficult to obtain the sheet resistance as contemplated by the present invention.

Also, in producing the AlN junction body, Yushio et al. '400 do not disclose or suggest forming the adhesive layer by using an adhesive paste containing AlN or continuously conducting the sintering in two steps. Therefore, Yushio et al. '400 are not capable of producing the AlN junction body of the present invention having the above-mentioned properties and do not teach or suggest the present invention.

As the Examiner noted, the *prima facie* case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed products. Applicants respectfully submit that the prior art products do not possess the sheet resistance of the present invention for the reasons given above. As such, the Examiner's *prima facie* case has been rebutted.

Turning to the next reference, Yamakawa et al. '907 disclose a method of producing an AlN junction body by applying a high-melting metal paste containing W and Mo onto the surface of an AlN sintered substrate and bringing another AlN sintered substrate into pressed contact with the high-melting metal paste, followed by sintering.

However, in the AlN sintered body of Yamakawa et al. '907, the high-melting metal layer that is formed also has a large electric resistance. Like Yushio et al. '400, the sheet resistance of Yamakawa et al. '907 is higher than that of the present invention. Moreover, the

warping in Yamakawa et al. '907 is much greater than the present invention. Thus, Yamakawa et al. '907 fail to overcome the deficiencies of Yushio et al. '400.

More specifically, Yamakawa et al. '907 are not using the adhesive paste that contains AlN. When the sintering is effected while press-contacting the AlN sintered substrate without using the AlN-containing adhesive paste, a carbide forms on the surface of the sintered metal layer due to a carbon gas generated at the time of firing (firing is conducted in a reducing atmosphere), and as a result, the electric resistance increases as described on page 16, line 32 to page 17, line 27 in the present specification. An increase in the electric resistance can be prevented by suppressing the contact between the sintered metal layer and the carbon gas by using an AlN-containing adhesive paste.

Furthermore, Yamakawa et al. '907 are not effecting the sintering in two steps. At the time of sintering, the metal particles contract at one time, developing a large warping. By conducting the sintering in two steps as in the present invention, the metal particles contract gradually, and as a result, warping can be suppressed.

Regarding the final reference, Applicants respectfully submit that Ito et al. '223 have no relation to the present invention and would not be considered relevant by one of ordinary skill in the art. That is, Ito et al. '223 disclose a technology for producing a ceramic junction body by sintering (so-called co-firing) an electrically conducting paste interposed between the green sheets (which are not the sintered bodies), which is radically different from the present invention.

In stark contrast, the present invention employs means for firing two pieces of AlN sintered plates (which have been sintered already), holding the high-melting metal paste therebetween.

Ito et al. '223 disclose a particle size distribution of metal particles in the electrically conducting paste. However, the particle size distribution is merely one of the conditions for favorably conducting the co-firing, which is not a condition for avoiding the warping contemplated by the present invention.

Therefore, Applicants respectfully submit that Ito et al. '223 do not teach the present invention. Even if Ito et al. '223 are combined with the other cited prior art, the AlN junction body of the present invention having the above properties is not obtained.

To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (See MPEP 2143.03). As discussed above, the combination of references fails to teach or suggest all the claim limitations of independent claim 1 as well as claim 2 dependent thereon. Therefore, a *prima facie* case of obviousness has not been established, and withdrawal of the instant rejection is respectfully requested.

In summary, Applicants respectfully submit that significant patentable distinctions exist between the present invention and the cited art. Therefore, there exists no *prima facie* case of obviousness. Accordingly, the Examiner is respectfully requested to withdraw this rejection and allow the currently pending claims.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad M. Rink, Reg. No. 58,258 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By

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